

# LONGFELLOW BRIDGE

## REHABILITATION PROJECT

### BRIDGING THE PAST AND THE FUTURE



Spring 2009

## THE PROJECT

The Massachusetts Highway Department (MassHighway) and the Massachusetts Department of Conservation and Recreation (DCR) are jointly undertaking a major project to restore and rehabilitate the historic Longfellow Bridge across the Charles River. The project includes meeting Federal Highway Administration standards to improve safety and accessibility for pedestrians, bicyclists and automobile traffic. The Massachusetts Bay Transportation Authority's (MBTA) Red Line tracks are an integral part of the bridge structure, so MassHighway will renovate the tracks as part of this project. Improved lighting and safety rails are also planned.

The bridge is an important transportation link between Boston and Cambridge, but it is also a visual, architectural and engineering icon on the Boston skyline. The project design will be sensitive to this architectural and historic significance. The Longfellow Bridge is popularly known as the Salt and Pepper Bridge because its pairs of neoclassically inspired granite towers bring salt and pepper shakers to mind. The project will be subject to a comprehensive review looking specifically at architectural and historic issues. The renovation team will work within the guidelines of the Secretary of Interior's Standards of Rehabilitation, or Section 106, and with the Massachusetts Historical Commission and Boston and Cambridge agencies to ensure that historic issues are identified and addressed.

## Project Purpose and Goals

**T**he Longfellow Bridge Rehabilitation Project will repair deteriorated parts of the bridge structure and improve the bridge-to-city-street connections. The repairs and modifications will be consistent with the historic character of the bridge.

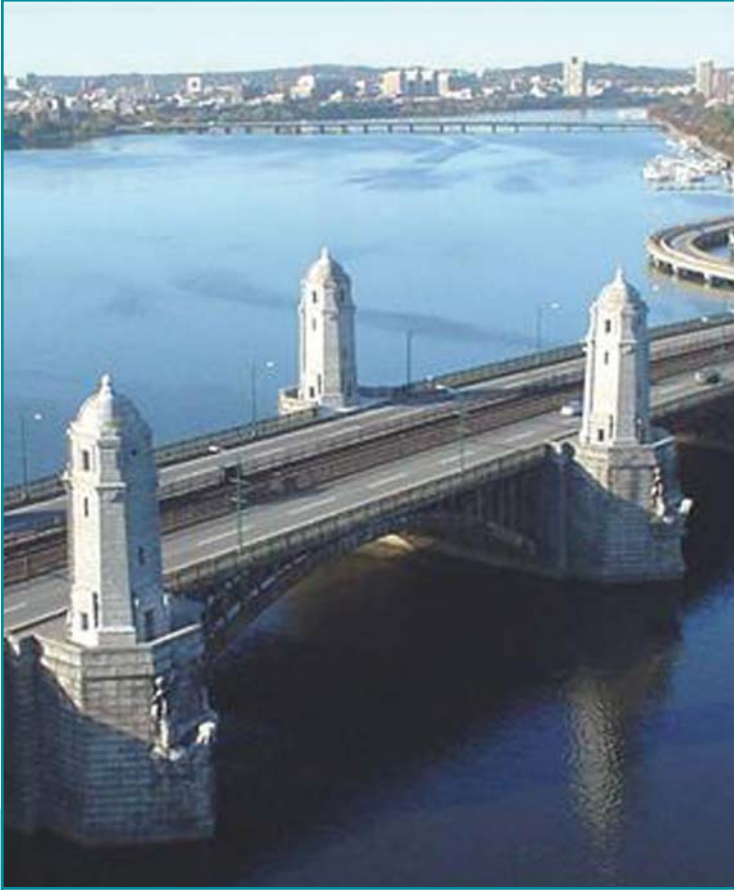
The bridge currently carries approximately 28,000 motor vehicles, 90,000 Red Line passengers and significant numbers of pedestrians and bicyclists each day. It is a vital transportation link. MassHighway is committed to the goals of minimizing disruption to vehicle, bicycle and pedestrian traffic, limiting delays at Charles Circle, and maintaining Red Line service throughout the project. The project is part of the Commonwealth's Accelerated Bridge Program, which is expediting the repair of bridges with serious deficiencies by 2016.

## Brief History of the Longfellow Bridge

**T**he West Boston Bridge was built in 1793 at the location of the Longfellow Bridge. In the early 20th century, the Charles River Basin was developing as a recreational resource, increasing uses of and traffic on the bridge. To accommodate this use, the Boston/Cambridge Bridge Commission completed the Longfellow Bridge in 1907. In 1912, rapid transit was added to the bridge, and in 1932, the Charles/MGH Red Line station was built. The Charles River Esplanade was completed in 1934 and Storrow Drive and Memorial Drive added in 1949 and 1956, respectively. The Memorial Drive construction added two spans at the Cambridge approach to the bridge.

The only major reconstruction of the bridge occurred in 1959 when extensive repairs were made to the superstructure. In 2004, DCR took ownership of the bridge from the Metropolitan District Commission (MDC) after a reorganization of state agencies.

The Longfellow Bridge is a contributing element of the Charles River Basin Historic District and it is individually eligible to be listed on the National Register of Historic Places. Because of the bridge's architectural and historic significance, the project will undergo a comprehensive historic review process. ■



## The Bridge Today

The bridge today consists of 11 original steel arch spans, with two steel girder approach spans added at the Cambridge end when the bridge was extended in 1956. The overall length is 2,135 feet and the deck width is 105 feet, which includes a 27-foot fenced median used by the MBTA for Red Line service. The existing cross-section provides an upstream 6-foot sidewalk and a 33-foot wide roadway, while the downstream side consists of a 10-foot sidewalk and 29-foot wide roadway. The bridge's substructure is built of granite block masonry and consists of ten hollow piers and two hollow abutments. The two central piers carry the signature pairs of granite towers that lend the name Salt and Pepper to the Longfellow Bridge.

Inspections performed in 2007 and 2008 confirmed that significant deterioration had occurred since the last major rehabilitation program in 1959. MassHighway and DCR embarked on a program of regular, in-depth inspections, maintenance and interim repairs that is ongoing as the project advances through design and into construction. Interim repairs will extend the bridge's service life an additional 8–10 years, which will ensure the safety of the bridge through completion of construction.

The bridge towers, railings and lighting will also be addressed in this restoration. New safety railings will separate pedestrians from vehicular traffic. The bridge lighting will be improved, but its style will reflect the age and status of the bridge. The new sidewalks will permit walkers and wheelchair users more space and the new bike path offers riders a safer space. ■

## The Design Challenges

The challenges in renovating an historic bridge are to update the structure to meet MassHighway standards, suit the users, and maintain a balance between these goals and the historic elements of the bridge. The restored bridge must also comply with Americans with Disabilities Act (ADA) standards.

On the Boston side, the Charles/MGH Station stretches over part of the roadway, and the presence of the MBTA tracks — known as the MBTA Reservation — reduces the available space that can be used for improvements by five feet below the typical cross section. In addition, the sidewalk currently disappears east of the bridge abutment and pedestrians and bicyclists have to battle with vehicles at this point. Over most of the bridge, the design team is proposing to re-allot the space to fit current uses more safely and efficiently.

Based on these conditions, the design team developed three alternatives for upgrading the Boston approaches: (1) widen the bridge at the "pinch point," or (2) use narrowed roadway and/or bike lanes and sidewalks options. Each of the alternatives includes some compromises. ■

## Preliminary Design

In the late 1980s, the MDC formed an Advisory Committee to participate in an architectural review of the Longfellow Bridge. In the late 1990s, the MDC conducted inspections and studies of the bridge and completed remedial repairs. The cities of Boston and Cambridge, bicycle coalitions, historical commissions, business and civic groups were involved in these earlier efforts and the same interests are participating in the current project.

Preliminary design includes investigating design concepts, developing rehabilitation and restoration alternatives and recommendations, preparing cost estimates and presenting options to the public. The design process will also include structural rehabilitation, FHWA standards compliance, and historic restoration. It will address architectural and aesthetic issues; improving bicycle and pedestrian access and movement and bridge-to-city street connections; and renovating the Red Line tracks and maintaining Red Line service.

While evaluating alternatives, MassHighway will consider potential disruptions that a design might cause the users and neighbors and include measures to minimize them in the construction planning. ■





## Boston Approach Alternatives

### Alternative 1

This option widens the bridge over the first span by removing the granite parapet wall and extending the bridge superstructure out by several feet. In addition, to the east of the abutment, the existing granite retaining wall will be dismantled and rebuilt about 12 feet to the south. This gives pedestrians and bicyclists more space — 5 feet each — except for a short distance when the bike lane will be 4 feet wide at the original pinch point. It also allows three travel lanes for traffic at the intersection, one for left turns and two through lanes. This option meets most of the user and safety goals, but it has the most impact from historical and architectural perspectives.

### Alternative 2

This compromise option works by reducing the roadway lanes to 10.5 feet and making the sidewalk and bicycle lane 3.5 feet wide. East of the abutment tower, the granite wall will be dismantled and rebuilt about 12 feet south. This permits three vehicle travel lanes at the traffic light with some transitions. The bike lane merges with the through lane, putting bicyclists in the traffic lanes as they exit the bridge.

### Alternative 3

The roadway lanes are 11 feet wide, while the sidewalk and bike lanes are 3 feet wide in this option. There is no widening at the so-called pinch point, but otherwise, the bike lane and sidewalk are 5 feet wide. Only two travel lanes are provided and the granite wall remains in its current position. This option presents the least impact on the bridge from a historical point of view, but it will increase traffic congestion and does not comfortably accommodate pedestrians and bikes.

*The "pinch point" is on the upstream, Boston side of the bridge and does not meet accessibility standards.*



MassHighway and DCR are presenting the options to the public to gather comments and suggestions. Construction phasing options are outlined on page 4 for review as well. ■

## The Public Process

MassHighway and DCR outlined the project for the communities of Boston and Cambridge in fall 2005. In spring 2006, the agencies presented the alternatives to the public and to representatives of the historical agencies. The presentations included details on the alternatives, plans to manage the replacement of the MBTA tracks and preliminary information on construction mitigation. The project planners are also aware of plans to reconstruct other Charles River bridges and access roads, such as the Storrow Drive Tunnel. The schedule is outlined on page 4.

*MassHighway welcomes comments and suggestions on the alternatives. See below for contact information.* ■

## Key Contacts

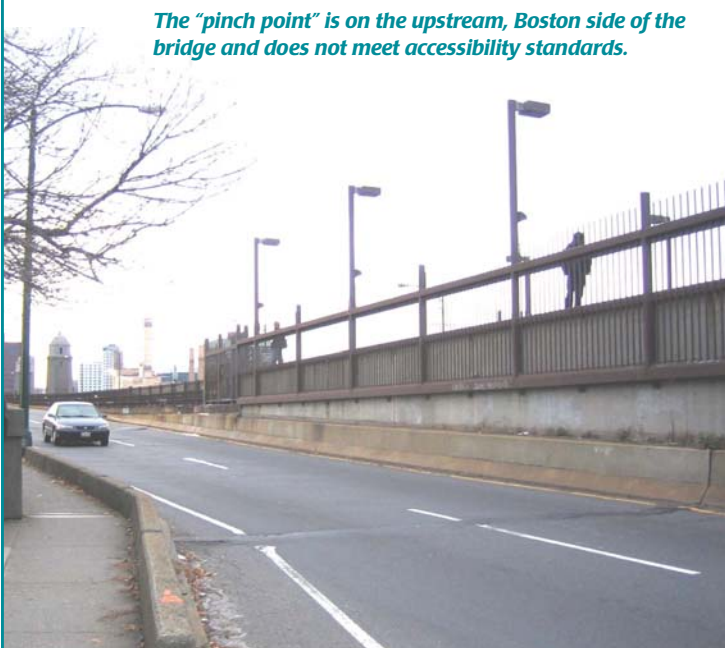
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To view project presentations, reports and other information, please visit the website at [www.mass.gov/mhd/longfellowbridge](http://www.mass.gov/mhd/longfellowbridge).

*To be added to the project mailing database, please contact:*

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## Construction Approach

MassHighway and DCR are currently investigating two options for maintaining vehicular, Red Line, bicycle and pedestrian traffic during construction. Criteria such as impacts to abutters and bridge users will be considered, as well as cost and time savings. The first option includes detouring westbound vehicles to Cambridge off the Longfellow Bridge, which will facilitate construction and reduce its overall duration by at least 12 months. In the second option, all traffic stays on the bridge and construction is completed in a phased approach, lane by lane. Details of each alternative are as follows:

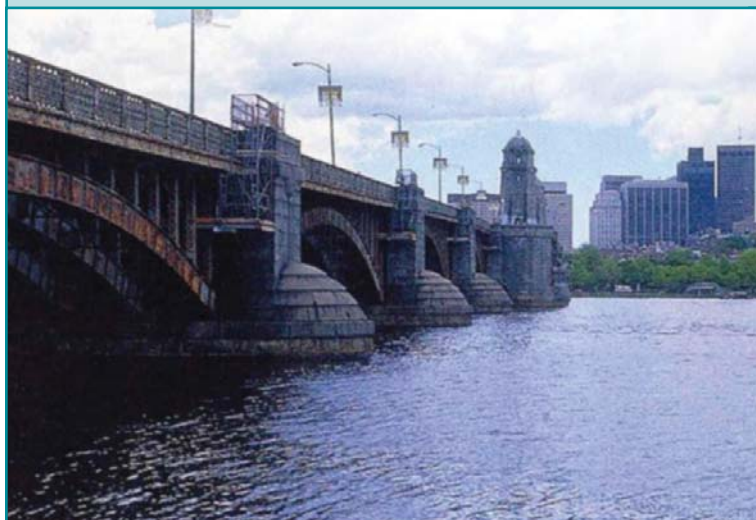
**Option 1, PHASE 1:** This option detours all westbound (Cambridge bound) traffic using Monsignor O'Brien Highway across the Charles River Dam so the traffic lanes on that side of the bridge can be used for both Red Line Tracks (one in the fast lane on a temporary track) and eastbound traffic from Cambridge to Boston in the slow lane. This allows the contractor to demolish and reconstruct the eastbound side of the bridge: the sidewalk, existing travel lanes and inbound Red Line track. At the end of this phase, the contractor will construct a temporary Red Line track on the fast lane of the new roadway to prepare for Phase 2. **PHASE 2:** Reopen the eastbound side to allow reconstruction of the westbound deck, travel lanes and outbound Red Line. The inbound Red Line operates on the new temporary track and the outbound Red Line is on the newly completed track. **PHASE 3:** The westbound travel lanes reopen, the Red Line operates on the new tracks and the eastbound travel lanes are opened.

**Option 2:** Work takes place in limited portions of the bridge width at a time to maintain transportation functions. **PHASE 1:** The contractor is working below the eastbound slow lane and sidewalk and the westbound fast lane. **PHASE 2:** Work shifts to below the eastbound fast lane and westbound slow lane and

sidewalk. **PHASE 3:** The contractor builds a temporary track on the new, westbound fast lane. The outbound Red Line track is relocated to the temporary track and the inbound track is shifted to the existing outbound side. The deck below the inbound Red Line is demolished and rebuilt. **PHASE 4:** Inbound Red Line service is moved back to the new track in its existing location and the outbound track remains on the temporary track on the westbound roadway. The deck below the outbound Red Line is demolished and rebuilt. Some weekend Red Line shutdowns are necessary as work shifts between phases, but service will operate as usual at other times.

**Access and Traffic Management:** Both options maintain one sidewalk for pedestrians at all times. Bicyclists will follow traffic detours in each stage. Police details will monitor traffic throughout construction. Access for emergency vehicles will always be maintained and given preference in day to day traffic management. Monsignor O'Brien Highway or Massachusetts Avenue can be used as alternate routes. There may be some lane closures on Memorial Drive and Storrow Drive when work takes place on the spans above the roadways; however, nighttime and off-peak hours will be used to minimize impacts. Specific navigational channels may be closed, but marine traffic will always be maintained and notifications will be distributed to mariners by the US Coast Guard.

**Construction Impacts:** Limited space is available in the vicinity of the bridge. Contractor parking will be discouraged. Removal and delivery of materials will be scheduled during off-peak and nighttime hours to minimize impacts. Impacts from nighttime work and other construction related issues such as noise and dust will be minimized to the extent possible by using temporary enclosures around the work site. Construction management details will be further refined as plans are developed. ■



*The project includes restoring the original decorative railing and replicating the original lighting fixtures with luminaires that meet modern safety standards.*

## Project Schedule

Preliminary Design	June 2005 – May 2009
Final Design	June 2009 – July 2010
Construction: Request for bids	Fall 2010
Construction	2011 – 2014
Surveys, borings and inspections	Fall 2005/Winter 2006
Periodic stakeholder group and public meetings	September 2005 – 2010
Environmental Notification Form	March 16, 2009
Section 106 review (National Historic Preservation Act)	September 2005 – Ongoing
Preliminary design public hearing	Early Summer 2009

